Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	1488	membrane sam and layer	USPAT; EPO; DERWENT	AND	ON	2005/09/01 18:39
L2	120	l1 and mercapto	USPAT; EPO; DERWENT	AND	ON	2005/09/01 18:39
L3	25	l2 and derivatized	USPAT; EPO; DERWENT	AND	ON	2005/09/01 18:40
L4	0	l3 and mer capto derivatized	USPAT; EPO; DERWENT	AND	ON	2005/09/01 18:40
L5	25	l3 and mercapto derivatized	USPAT; EPO; DERWENT	AND	ON	2005/09/01 18:40
L6	0	l5 and struvite	USPAT; EPO; DERWENT	AND	ON	2005/09/01 18:42
L7	12	l5 and magnesium ammonium phosphate	USPAT; EPO; DERWENT	AND	ON	2005/09/01 18:47
L8	0	l5 and "magnesium ammonium phosphate"	USPAT; EPO; DERWENT	AND	ON	2005/09/01 18:47
L9	0	l1 and sruvite	USPAT; EPO; DERWENT	AND	ON	2005/09/01 18:48
L10	1	sam adj membrane	USPAT; EPO; DERWENT	AND	ON	2005/09/01 18:48
L11	0	l1 and struvite	USPAT; EPO; DERWENT	AND	ON	2005/09/01 18:48
L12	32	"magnesium ammonium phosphate" and membrane	USPAT; EPO; DERWENT	AND	ON	2005/09/01 18:49
L13	5	l12 and struvite	USPAT; EPO; DERWENT	AND	ON	2005/09/01 18:52
L14	0	membrane and posively charged and struvite	USPAT; EPO; DERWENT	AND	ON	2005/09/01 18:53
L15	4	charged membrane and struvite	USPAT; EPO; DERWENT	AND	ON	2005/09/01 18:54

L16	0	"charged membrane" and struvite	USPAT; EPO; DERWENT	AND	ON	2005/09/01 18:55
L17	7546	"ion exchange membrane"	USPAT; EPO; DERWENT	AND	ON	2005/09/01 18:55
L18	0	l17 and struvite	USPAT; EPO; DERWENT	AND	ON	2005/09/01 18:55
L19	808	phosphate and l17	USPAT; EPO; DERWENT	AND	ON	2005/09/01 18:56
L20	471	l19 and ammonium	USPAT; EPO; DERWENT	AND	ON	2005/09/01 18:56
L21	180	l20 and magnesium	USPAT; EPO; DERWENT	AND	ON	2005/09/01 18:56
L22	0	l21 and "magnesium ammnium phosphate"	USPAT; EPO; DERWENT	AND	ON	2005/09/01 18:57
L23	0	"magnesium ammnium phosphate" and membrane and sulfonic acid	USPAT; EPO; DERWENT	AND	ON	2005/09/01 18:57
L24	0	"magnesium ammnium phosphate" and arylic same membrane	USPAT; EPO; DERWENT	AND	ON	2005/09/01 18:58
L25	0	"magnesium ammnium phosphate" and arylic adj membrane	USPAT; EPO; DERWENT	AND	ON	2005/09/01 18:58
L26	0	"magnesium ammnium phosphate" and acrylic membrane	USPAT; EPO; DERWENT	AND	ON	2005/09/01 18:59
L27	0	"magnesium ammnium phosphate" and "acrylic membrane"	USPAT; EPO; DERWENT	AND	ON	2005/09/01 18:59
L28	0	struvite and acrylic adj membrane	USPAT; EPO; DERWENT	AND	ON	2005/09/01 19:00
L29	20859	cation exchange and membrane	USPAT; EPO; DERWENT	AND	ON	2005/09/01 19:00
L30	20859	l29 and membrane	USPAT; EPO; DERWENT	AND	ON	2005/09/01 19:00
L31	4	l29 and struvite	USPAT; EPO; DERWENT	AND	ON	2005/09/01 19:01

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L2: Entry 1 of 1   File: USPT   Feb 24, 1998

DOCUMENT-IDENTIFIER: US 5720882 A
TITLE: Treatment method for waste water sludge comprising phoshorous, heavy metals
and at least one metal

Detailed Description Text (19):
The process of the invention has several alternative modes of operation. One
interesting alternative, which greatly improves the recovery of nutrients i.e.
phosphorus and ammonia of the waste water, is such that the metal sludge is formed
by neutralizing the acidic hydrolysate with a Mg-compound. This has the effect that
$MgNH_4 PO_4 6H_2 O$ (struvite) will precipitate into the metal sludge
reducing the content of ammonia in the hydrolysate. If Mg-compounds and possibly
ammonia are properly used in all pH adjustments of the process so that the number
of moles of ammonia equals to the number of moles of phosphorus corresponding to
the mole ratio in $MgNH_4 PO_4$, then after the final precipitation of
$MgNH_4 PO_4$ no ammonia will be left and none of it has to be returned to
the waste water process. Hence all nutrients have been recovered. If only Mg-
compounds have been used in pH adjustments the remaining filtrate solution contains
primarily $MgSO_4$, which can be separated by evaporation and obtain a product of
commercial value.

Detailed Description Text (30):
In this example $NH_4 OH$ was used for pH adjustment. Precipitation of heavy
metals was performed at pH 4.0 using $Na_2 S$-solution. The heavy metal
precipitate contained 4% of the original phosphorus and 4% of the original
aluminium. Next, pH was raised to level 5.4. The precipitate contained 24% of the
original phosphorus and 63% of the original aluminium. After precipitation, MgO and
$NH_4 OH$ were added to the solution and pH rose to 9.0. A $MgNH_4 PO_4 -$
precipitate (struvite) was obtained with about 70% of the original phosphorus and
about 30% of the original aluminium. The mole ratio $[PO_4^{3-}]/[Al]$ was
6.0.

Detailed Description Text (46):
To an amount of 250 g of the filtrate solution from example 7, 5.32 g of $MgCl_2$
and 4 g of NH_3-solution (25%) were added to precipitate P as $MgNH_4$
PO_4. The pH was adjusted to 9. The solution was filtrated yielding a cake with
a dry weight of 3.55 g. The cake was analyzed by XRD and was identified as
$MgNH_4 PO_4 6H_2 O$ (struvite). The cake was dried to a dry weight of
3.55 g and analyzed. The dried cake contained 14% Mg, 4.5% NH_4, and 20.8% P.
The crystal water and half of the ammonia had evaporated during drying due to a too
high temperature. The yield of P in this precipitation was 96.3%. The filtrate
solution (246.5 g) contained <0.01% P.

Current US Original Classification (1):
210/638

Freeform Search

Database:
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Term:
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l11 and chamber and compartments
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Display: 10 Documents in <u>Display Format:</u> CIT **Starting with Number** 1

Generate: ○ **Hit List** ⦿ **Hit Count** ○ **Side by Side** ○ **Image**

Search   Clear   Interrupt

Search History

DATE: Thursday, September 01, 2005 <u>Printable Copy</u>   <u>Create Case</u>

<u>Set Name</u> <u>Query</u>	<u>Hit Count</u>	<u>Set Name</u>
side by side		result set
DB=USPT; PLUR=YES; OP=ADJ		
<u>L15</u> l11 and chamber and compartments	202	<u>L15</u>
<u>L14</u> L12 and liquid	344	<u>L14</u>
<u>L13</u> L12 and liqud	0	<u>L13</u>
<u>L12</u> L11 and chamber	403	<u>L12</u>
<u>L11</u> cation exchange membrane and device	759	<u>L11</u>
<u>L10</u> struvite crystals and membrane	4	<u>L10</u>
<u>L9</u> struvite crystals and membrane	4	<u>L9</u>
<u>L8</u> l6 and magnesium ammonium phosphate	0	<u>L8</u>
<u>L7</u> L6 and struvite	0	<u>L7</u>
<u>L6</u> L5 and phosphate	27	<u>L6</u>
<u>L5</u> ion exchange membrane and l1	94	<u>L5</u>
<u>L4</u> l2 and cation exchange	0	<u>L4</u>
<u>L3</u> L2 and ion exchange	0	<u>L3</u>
<u>L2</u> L1 and struvite	1	<u>L2</u>
<u>L1</u> 210/638.ccls.	814	<u>L1</u>

END OF SEARCH HISTORY